Technology in Rural Transportation

A recent study documented more than eighty proven, cost-effective, "low-tech" solutions to rural transportation needs, most developed or implemented by local transportation professionals. One of these solutions is outlined below:

Learn all about the simple solutions on the Internet at http://inform.enterprise.prog.org

The simple solutions report is available from Hau To at (503) 892-2533, or email: to@crc-corp.com

Advanced Technologies Highway Maintenance Vehicles

Overall goal:

The vision for the highway maintenance concept vehicle is to improve the level of service of snow and ice control based on collection and application of better highway, vehicle, and materials distribution information through the use of advanced technologies.

Technical approach:

Research is underway supported through a consortium of three snow belt states: Iowa, Michigan and Minnesota. The research solutions are focused in four areas: pavement surface snow and ice control (plowing and de-icing), fleet utilization (AVL and communications), on-vehicle materials management (combining roadway surface information with onboard inventory systems), and equipment management (onboard engine diagnostics). The project is broken into four phases. The first phase focused on describing the desirable functions of a concept maintenance vehicle and evaluating its feasibility. Phase II will include the development, operation, and evaluation of prototype winter maintenance vehicles. Phase III consists of the prototype evaluation, benefit/cost analysis, and business system integration. Phase IV will be to perform a comprehensive field evaluation of 30 vehicles and the development of the procurement specifications.

Current status:

Prototype vehicles are being tested in each of the three member states.

Location / geographic scope:

Iowa, Michigan and Minnesota

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Agencies involved:	Initial membership in this consortium: State Departments of Transportation for Iowa, Michigan, and Minnesota; and the Iowa State University Center for Transportation Research and Education. Other public sector participants and observers include FHWA, other state transportation departments, public works agencies, and representatives of local government agencies. Potential private sector participants: vehicle manufacturers, vehicle component manufacturers, onboard vehicle tracking and communications manufacturers, and technology manufacturers and integrators.
Cost information:	Per-state costs range from approximately $200,000 to $225,000. The final budgeted costs for three states are approximately $650,000.
Key contacts:	Duane Smith, Center for Transportation Research and Education, Iowa State University (515) 294-8103 Leland Smithson, Maintenance Division, Iowa DOT, (515) 239-1519
Have goals been achieved?	An analysis of the full implications of the concept maintenance vehicle has not been completed. However, several impacts have already been determined: - Proof of concept was successful for all functions (pavement friction condition, ambient condition measures, automatic vehicle location, applying materials, providing additional horsepower during periods of high demand, and on-board data processing) except for improving vehicle visibility, rear obstacle alarm, and real-time data communications. - Results of proof of concept activities resulted in modifications to technologies for Phase III. - Operators found that the automatic material spreaders to be the best working feature.
Solution timeline:	Phase I and II are complete. Three concept vehicles were installed with selected technologies (PlowMaster computer, global positioning system, Norsemeter ROAR friction meter, pavement/air temperature sensors, engine power booster, high-intensity discharge warning lights, and reverse obstacle sensor) to conduct proof of concept. Phase III is currently underway.

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